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Wastewater:
The Hidden Threat of Our Nation's Changing Shoreline

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Linda Woods,
Town of Edisto Beach

Much of the nation's shoreline is changing. Small beach cottages are being replaced with what some call "megamansions." More people can stay in these plusher homes, which usually feature now-common amenities, such as dishwashers, icemakers, and sprinkler systems. While homeowners typically give much thought to the design and comfort level of these new homes, the water going down their drains can be out of sight, out of mind.

This forgotten wastewater often is flowing to the same septic system that served the older, much more modest cottage. If an overloaded septic system malfunctions, there is a potential hazard that harmful bacteria in the runoff could contaminate drinking water wells, estuarine water, and edible shellfish.

If this happens, residents who drink the infected water, swim or play in the estuary, or eat the tainted shellfish could become ill and never suspect the cause.

It is fears of this hidden threat that have spurred South Carolina coastal resource managers at the state and local level to proactively plug regulatory loopholes dealing with septic systems and act to educate those who work, live, and play along the shore.

Watching the Clothes Go Round

"Our belief is that a well-designed septic system is a very efficient way of treating effluent," says Joe Mole, chair of the Town of Edisto Beach Planning Commission. "The problem is that if it's not well designed or well managed, you can have a problem and not know it until late in the game."

Most residential septic systems consist of a buried 1,000-gallon tank and a drain field. As wastewater from showers, toilets, washing machines, dishwashers, and sinks flows into the tank, the heavier solids settle to the bottom and the lighter solids, greases, and oils float to the top. The liquid wastewater, or effluent, flows into the drain field where it is treated as it percolates through the soil to the groundwater.

There are a number of reasons septic systems can fail, says Lisa Hajjar, soil scientist with the Coastal Nonpoint Source Management Program in South Carolina's Department of Health and Environmental Control's (DHEC) Office of Ocean and Coastal Resource Management.

If more wastewater than the system can handle is pushed through the tank, or the tank is not pumped regularly, the sludge may spill out into the drain field, eventually causing the septic system to fail. Too much surface water near the drain field, say from a sprinkler or irrigation system, or unsuitable soils can also keep the ground from adequately cleansing the wastewater.

Finding the Loopholes

South Carolina regulates septic systems by requiring that DHEC issue a permit before construction can begin on a new home that will use a septic system. The size and type of the permitted septic system is based on the planned number of bedrooms. Estimating two people per bedroom determines how many gallons of water the septic tank must be able to handle on average, Hajjar explains.

Local governments, however, have discovered some problematic loopholes in the state requirements.

For instance, building plans are increasingly featuring rooms, such as libraries or dens, that do not count in DHEC's calculations determining the septic system's size. These rooms often can and are used as bedrooms, which is particularly an issue in homes used as vacation rentals. Such a house might be built with three bedrooms, but might later be advertised as sleeping 20.

Another regulatory gap is the remodeling of a home. The current state regulations allow the property owner to use the existing septic system with no review, even if there is a significant increase in the size of the home and the number of people who can stay there.

Taking It into the Bedroom

Many local governments are stepping in to fill these regulatory gaps. The Town of Edisto Beach on one of South Carolina's barrier islands is addressing septic systems and other nonpoint source pollution by limiting square footage of new and remodeled homes, establishing a minimum lot size, and even defining the word "bedroom."

While regular water quality monitoring shows no signs of a problem with septic systems on Edisto, Joe Mole explains that the community is proactively addressing the issue because "we were warned by DHEC that we had a potential problem" on an area of the beach where the soil was so sandy, the effluent might not be adequately filtered.

"The state couldn't take action unless there was a major spill or contamination, and we wanted to cut it off before it got that far," Mole says.

The town now requires a new DHEC septic system permit if reconstruction or improvements to a house results in an increase in square footage. An ordinance was passed prohibiting homeowners from paving over drain fields or septic tanks, and there is now a minimum lot size.

One of Edisto's more interesting approaches has been to define the word "bedroom."

"We went on the Internet and gathered ordinances from all over the country," says Linda Woods, administrator for the Town of Edisto Beach. "The intent was not to restrict the number of bedrooms, but to relate the size of the septic system to the uses of the house."

Linda Peeples, Edisto's building codes administrator, notes the town has also started a voluntary maintenance program for homeowners. "We're trying to convince people that it's in their best interest to have their system inspected on a regular basis because repair costs will be considerably higher than just taking care of their system in the first place."

To address storm water runoff in general, the town has put limits on the overall square footage of new construction, and the amount of impervious surface, such as driveways, that can be put around new homes.

If They Only Knew

To help bridge the gap between the limitations of the state's regulatory authority over septic systems and the federal 6217 statute requiring states to address coastal nonpoint source pollution, South Carolina's coastal program is working to educate homeowners and related professionals about septic systems, and to assist local governments in their efforts to regulate them.

The coastal program's efforts include conducting a survey of stakeholders in coastal counties, such as staff of local governments, septic installers and pumpers, county and city engineers, public works department staff, and home inspectors. "The overall perception," Lisa Hajjar says, "is that a lot of homeowners don't even know where their septic system is, much less how to properly operate it."

As a result of the survey, the coastal program helped develop a training program for septic system inspectors, and created a South Carolina homeowner's guide and record keeping folder, which was distributed in the state's eight coastal counties. DHEC liked the guide so much, Hajjar says, it is now distributing the folder with every septic system permit issued across the state.

Hajjar works with communities to draft ordinances to help manage septic systems and will soon be working with Clemson University in South Carolina to develop a short course for real estate agents, "so they will pass the information on to homeowners."

It Beats the Alternative

Beach communities like Edisto want to keep septic systems as a long-term solution for wastewater treatment.

"Putting in a sewer system is an enormous cost and you open yourself up to higher development densities, which will change the character of these communities," Hajjar explains.

The challenge, she says, comes in making sure septic systems keep up with the development that is occurring.

For more information on South Carolina septic system education efforts, contact Lisa Hajjar at (843) 747-4323, or hajjarlm@dhec.sc.gov. For more information on the Town of Edisto Beach's effort to address septic systems, contact Linda Woods or Linda Peeples at (843) 869-2505.

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